## Lab Assignment-2

### 2. Programming Excerices on C++

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2.1 Write a program to evaluate the following investment equation

$$V = P(1 + r)^n$$

and print the tables which would give the value of V for various of the following values of P, r and n:
P: 1000, 2000, 3000,.....,10,000
r: 0.10, 0.11, 0.12,.....,0.20
n: 1, 2, 3,.....,10
(Hint: P is the principal amount and V is the value of money at the end of n years. This equation can be recursively written as
V = P(1 + r)
P = V
In other words, the value of money at the end of the first year becomes the principal amount for the next year and so on).

2.2 Write a program that defines a function that receives 4 arguments— char, int, float and double in that order. Make 3 calls to this function. In the second call, pass only 3 arguments; the last one should be taken as 6.28 by default. In the third call, pass only 2 arguments. In this case the third argument should be taken as 3.14 and fourth as 6.28 by default.

2.3 Write a function power() to raise a number m to power n. The function takes a double value for m and int value for n and returns the result correctly. Use a default value of 2 for n to make the function to calculate the squares when this argument is omitted. Write a main that gets the values of m and n from the user to test the function.

2.4 Write a function that creates a vector of user given size M using new operator.

2.5 Write a function that performs the same operation as that of Problem no. 2.4 but takes an int value for m. Both the functions should have the same name. Write a main that calls both the functions. Use the concept of function overloading.

2.6 Write a program to calculate the variance and standard deviation of N numbers.

$$Variance = \frac{1}{N}\sum_{i=1}^{N}(x_i - \bar{x})^2$$

$$StandardDeviation = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(x_i - \bar{x})^2}$$

where

$$\bar{x} = \frac{1}{N}\sum_{i=1}^{N}(x_i)$$

2.7 Write a program to determine if the integers in an array follow either an arithmetic or geometric progression. An arithmetic progression is one where the difference between each successive pair of integers is constant, for example in the array [2, 4, 6, 8] the difference between the integers

is always 2. A geometric progression is one where each element in the array is the product of the previous integer multiplied by some constant or ratio, for example in the array [3, 9, 27, 81] each element is a result of the previous element multiplied by 3.